

WHAT IS CLAIMED IS:

1. A method of identifying a fungicide, comprising
 - 5 (a) bringing ribose-5-phosphate isomerase enzyme or a host cell comprising a polypeptide from phytopathogenic fungi encoded by a nucleic acid with the biological activity of ribose-5-phosphate isomerase, into contact with a chemical compound or a mixture of chemical compounds under conditions which allow the interaction of the chemical compound or the mixture of chemical compounds with the ribose-5-phosphate isomerase enzyme or the polypeptide,
 - 10 (b) comparing ribose-5-phosphate isomerase activity in the absence of the chemical compound or the mixture of chemical compounds with the ribose-5-phosphate isomerase activity in the presence of the chemical compound or the mixture of chemical compounds, and
 - 15 (c) identifying the chemical compound or mixture of chemical compounds which specifically inhibit ribose-5-phosphate isomerase activity.
 2. The method according to Claim 1, fungicidal action of the identified chemical compound or mixture of chemical compounds is tested in a subsequent step (d) by bringing said identified chemical compound or mixture of chemical compounds into contact with a fungus.
 - 25 (d)
 3. A method of identifying one or more fungicidal compounds comprising identifying said fungicidal compound with a member selected from the group consisting of a polypeptide having the biological activity of ribose-5-phosphate isomerase, a nucleic acid encoding a polypeptide with the
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biological activity of ribose-5-phosphate isomerase and one or more host cells said host cell including a polypeptide having the biological activity of ribose-5-phosphate isomerase.

- 5 4. A fungicide, said fungicide comprising a modulator of a polypeptide having the biological activity of ribose-5-phosphate isomerase.
5. A method for controlling phytopathogenic fungi comprising controlling phytopathogenic fungi with a modulator of a polypeptide having the biological activity of ribose-5-phosphate isomerase..
- 10 15 6. A fungicidal modulator of a polypeptide having the biological activity of ribose-5-phosphate isomerase which modulator is identified by a method according to Claim 1 or 2.
- 15 7. A nucleic acid encoding a polypeptide from phytopathogenic fungi with the biological activity of ribose-5-phosphate isomerase.
8. The nucleic acid as claimed in Claim 7, wherein said nucleic acid encodes a
20 *U. maydis* ribose-5-phosphate isomerase.
9. The nucleic acid according to Claim 7 or 8, wherein said nucleic acid takes the form of single-stranded or double-stranded DNA or RNA or fragments of genomic DNA or cDNA.
- 25 10. The nucleic acid as claimed in Claim 7, comprising a sequence selected from
a) the nucleic acid sequence of SEQ ID NO: 1,

- b) a nucleic acid sequence which encodes a polypeptide with the amino acid sequence of SEQ ID NO: 2,
- 5 c) a nucleic acid sequence which encodes a polypeptide with at least one of the consensus sequences of the following group of consensus sequences:
- (I/V)GIGSGSTV-, -(I/V)D(I/V)X₂DGADE(I/V)DX₂LX₂IKGG-, -
(P)TG(F/D)QSX₂LI-, -EK(V/L)X₄AX₂F(I/V)XVADX(R/S)K-, -
WX₂G(I/V)PIEVXP-, -AKAGP(I/V)VTDNXNFX(I/V/L)D-, -
IKXLXGVXEXGLF-, -AYFGNXDG-,
- 10 d) part-sequences of the sequences defined under subparts a) to c) of this Claim 10 which are at least 15 base pairs in length,
- 15 e) sequences which hybridize with the sequences defined under subparts a) to c) of this Claim 10 at a hybridization temperature of 42-65°C,
- f) sequences with at least 60% identity with the sequences defined under subparts a) to c) of this Claim 10,
- 20 g) sequences which are complementary to the sequences defined under subparts a) to f) of this Claim 10, and
- 25 h) sequences which, owing to the degeneracy of the genetic code, encode the same amino acid sequence as the sequences defined under subparts a) to c) of this Claim 10.
11. A DNA construct comprising a nucleic acid according to any one of Claims 7 to 10 and a heterologous promoter.

12. A vector comprising a nucleic acid according to any one of Claims 7 to 10, or a DNA construct according to Claim 11.
13. A vector according to Claim 12, wherein the nucleic acid is linked operably to regulatory sequences which ensure the expression of the nucleic acid in prokaryotic or eukaryotic cells.
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14. A host cell comprising a member selected from the group consisting of a nucleic acid according to any one of Claims 7 to 10, a DNA construct according to Claim 11 and a vector according to Claim 12 or 13.
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15. A polypeptide from phytopathogenic fungi having the biological activity of ribose-5-phosphate isomerase, wherein said polypeptide is encoded by a nucleic acid according to any one of Claims 7 to 10.
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16. A method for finding a chemical compound or a mixture of chemical compounds according to Claim 1 or 2, comprising identifying said chemical compound or mixture of chemical compounds with a polypeptide according to Claim 15.
17. A method of finding a compound which modifies the expression of the polypeptide defined in Claim 15, comprising:
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 - (a) bringing a host cell according to Claim 14 into contact with a chemical compound or a mixture of chemical compounds,
 - (b) determining a polypeptide concentration, and
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 - (c) identifying the compound or mixture of compounds which influence the expression of the polypeptide.